A → 10
B → 11
C → 12
D → 13
E → 14

Question 1 (10 Points)

YOU MUST SHOW your work clearly in each of the following parts

(i) [6 Points] Convert the following numbers from/to indicated bases:

a- $(263)_{10}$ = (100000111 $)_2$

for (a): 263 → 1, 131 → 1, 65 → 1, 32 → 0, 16 → 0, 8 → 0, 4 → 0, 2 → 0, 1 → 1, 0

b- $(125)_8$ = (85 $)_{10}$

$(1\times8^2)+(2*8^1)+(5*8^0)$

c- $(BE)_{16}$ = (276 $)_8$

$(11*16^1)+(14*16^0)$ → $(190)_{10}$

for (c): 190 → 6, 23 → 7, 2 → 2, 0

(ii) [4 Points] Perform the following arithmetic operations:

a- The binary sum of 111011 and 10111

```
 111011
  10111 +
-------
1010010
```

b- The binary multiplication (product) of 10011 and 110

```
   10011
     110 *
--------
   00000
  10011
 10011   +
--------
 1110010
```

1.5

Question 2 (10 Points)

What is the output of the following codes?

(1) **Suppose the user input is:**

1234 ITCS

103 978

```
char ch1,ch2;
int n;
string s1,s2;
cin >> ch1;
getline(cin, s1);
cin >> s2;
cin.get (ch2);
cin >> n;
cout << s1 << "\t "  << s2 << endl;
cout << ch1 << ch2 << n;
```

234 ITCS 103

1 978

(2)

```
int x=3;
cout << left << setfill('A') << setw(9)
     << "TEST" << endl;
cout << fixed << showpoint
     << setprecision(2);
cout << right << setfill('B') << setw(9)
     << 19.423111 << endl;
cout << setw(4)<< (x++ * 2);
```

TESTAAAAA

BBBB19.42

BBB6

(3)

```
char c='t';
switch (c){
      case 'c': case 'C':
            cout << "Canada" << endl;
            break;
      case 't': case 'T':
            cout << "Taiwan" << endl;
      default:
            cout << "Bahrain" << endl; }
```

Taiwan

Bahrain

(4)

```
int x=10;
while ( x < 80 ){
      cout << x << endl;
      x+=20;
}
```

10

30

50

70

Question 3 (5+5=10 Points) Satisfactory

A program is required to determine the total price for customer purchase in clothing shop according to the following rule:

- The shop calculates the **total price** = **clothe price x quantity purchased**

The program should generate a purchase receipt that contains clothe name, quantity purchased and total price. Assume **a customer buys only one clothe type per purchase**.

Part A: Identify the Inputs, Outputs variables and their applicable data types:

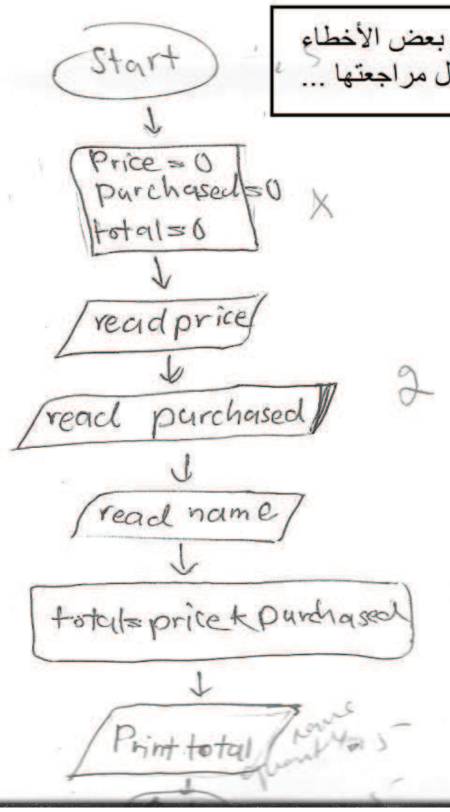
4.0

Variables' Description	Input/output?	Data Type
price	input	float
quantity purchased	input	float
name	input	string
total	output	float

Part B: Draw a flowchart for the above program.

4.5

قد تحوي الإجابة على بعض الأخطاء
فيرى تصحيحها قبل مراجعتها ...



Question 4 (15 Points)

The body mass index is used to determine an appropriate weight according to the weight and height of a person. Write a C++ program that reads from a file named "measures.txt" the weight of a person in kilograms and the height in meters. The program should find the value of the body mass index using the following formula:

$$\text{Body Mass Index} = \frac{\text{Weight}}{(\text{Height})^2}$$

Then the program should print in a file named "category.txt" a message describing the category of the person. The category is found according to the following table:

Body Mass Index	Category
<18.5	Underweight
18.5-25	Normal
25.1- 30	Overweight
>30	Obese

15

Excelent

SAMPLE INPUT/OUTPUT

measures.txt (input file)
65.0 weight 1.5 height

category.txt (output file)
Person Category is Overweight

للأمانة الإجابة غير كاملة في الأخير

```
# include <iostream>
#include <fstream>
using namespace std;        float
int main () { int weight , height , Mass ;
        ifstream infile ; infile.open("measures.txt");
        ofstream outfile ; outfile.open("category.txt");
        if ( ! infile){ cout << "No File" ; return -1; }
        else { infile >> weight >> height ;
             mass = (weight)/(height*height) ;
           if (mass<18,5) {outFile << "Person Category is underweight";}
      else if (mass>=18,5 && mass <=25) {
           outfile << "person Category is Normal " ; }
      else if (mass>=25,1 && mass <=30) {
           outfile << "Person category is Overweight " ;}
```

Question 5 (15 Points)

Write a C++ program that reads item numbers and their prices in a supermarket. Your program should continuously read until negative number is entered for the item number. The program should display the total number of items priced below BD 2.0 and the average price of items priced below BD 2.0. Format the average price to 3 decimal places. An appropriate **message** must be displayed **if there is no item priced below BD 2.0.**

Sample Input/ Output

```
Enter item no. (negative to stop): 111
Enter item Price 7.500
Enter item no. (negative to stop): 123
Enter item Price 1,950
Enter item no. (negative to stop): 332
Enter item Price 0.750
Enter item no. (negative to stop): -9

Total number of items priced below BD 2.0 is 2
Average price for items priced below BD 2.0 is 1.350
```

للأمانة :
الحل غير كامل في الأخير

```
#include <iostream>
#include <iomanip>
using namespace std;
int main () {                      float average = 0 ;
    int c = 0 ; float price ; int num ;
    cout << fixed << showpoint << setprecision (3);
    cout << "Enter item no. (nagative to stop) : "
    cin >> num ;
    cout << "Enter item Price " ;
    cin >> price ;
    while ( num >= 0 && Price >= 0)
    { if ( Price <= 2) { c++ ;
      average = (averge + price) / c ; }
    cout << "Enter item Price " ;
    cin >> num ;
```

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